TITLE OF THE INVENTION

Universal straps for all ages and sizes: stretchable and

Continuously adjustable straps for adult incontinence garments

CROSS REFERENCE TO RELATED APPLICATIONS

This Non-provisional Patent Application corresponds to the following two Provisional Patent Applications:

PPA 60/401,112 filed 08/05/2002

PPA 60/425,493 filed 11/12/2002

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

REFERENCE TO SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISK APPERDIX

Not Applicable

BACKGROUND OF THE INVENTION

In late December 2001, my wife developed acute allergic reaction (Stevens-Johnson Syndrome) to some of the anti-psychotic medications she was taking. On January 2, 2002, she was rushed to a local hospital for medical treatment, and was subsequently transferred to another hospital for re-establishing her anti-psychotic medication. When she was discharged from the hospital on March 8, 2002, she had lost her ability to control her urination as well as her bowl movement, thus necessitating the use of adult incontinence garments practically all the time. My invention, to be described below, was born out of the need to find a suitably designed belt by which

(1) her incontinence garment could be comfortably fitted to her waist;

(2) it would stay at her waist snugly; and

(3) it could also be lowered from her waist, and raised to her waist again, with relative ease without removing the garment completely.

I have tried to use the straps that come with packages of "belted undergarments" sold under the trademark of "Depend", as well as store-brand packages from stores like Target, Meijer, K-Mart, Kroger and Farmer Jack. These belts are all of the same design, and it is my understanding that they are the design of Bolick under U.S. Pat. No. 4,315,508. According to this design, each strap is made of an elastic belt with large elongation per unit stress, and a button, or a Velcro-type (or 3M-type) hook, is sewed at each end of the strap for attaching it to an incontinence garment. This type of straps is often too loose to hold a garment in place, particularly when the garment is soiled. The problem becomes even worse as the straps have been re-used for some time. Furthermore, without the multiple attachment locations in the garment as envisioned by Bolick in the same patent, the garment and the pair of straps as a whole is stretchable, but not adjustable. It is clear that this design falls short of serving the needs it was intended for.

In August 2002, I filed a Provisional Patent Application (Application No: 60/401112) which details my original invention aimed at providing a more usable strap for adult incontinence garments. For about three months immediately following the filing of this PPA, I concentrated my effort at finding an improved design that provides more suitable qualities and can be mass-produced and distributed more cheaply. The result of this effort formed the subject of another Preliminary Patent Application filed in November 2002 (Application Number 60/425,495). Together, these two Provisional Patent Applications form the basis for this Non-Provisional Patent Application.

BRIEF SUMMARY OF THE INVENTION

My invention successfully meets the needs mentioned above by having the belt, or strap, consist of a segment made of stretchable material and another segment the length of which can be adjusted to fit the waist of the garment-wearer. This design was described in a recent PPA (Provisional Patent Application No: 60/401,112). In the use of this design, the adjustable segment is adjusted so that the circumference of the incontinence garment, including the pair of belts, fits the waistline snugly with the stretchable segment stretched only very slightly. The stretchable segment comes to full use, however, when the garment is to be lowered from, or raised up again to the waistline. This design of mine is already far superior to the Bolick design: It affords both the comfort and fit that the Bolick design was aimed, but failed, to accomplish; and it is adjustable over a wide range when used with commercially available incontinence garments.

With additional improvements detailed in PPA 60/425,495, my invention now allows the straps to be continuously adjustable and further extends the range of adjustment. With these improvements, a single pair of straps can cover waistlines from 15cm (6") to 200cm (80"). The adjustable range can be made still wider if the straps of this improved design are used in connection with incontinence garments with larger lateral width.

To facilitate inexpensive manufacturing using readily available elastic material in the textile industry, I have also modified my design further to allow use of elastic belt with plush surface on one side only, and to allow the strap to be truly adjustable over any conceivable range of human waistlines.

Whereas my invention is primarily intended for use in connection with adult incontinence garment, it should also be useful for disposable diapers, and for ordinary and sports clothing such as sleeve openings on coats and jackets, and leg openings and waist fasteners on pants.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates, in schematic form, a single strap of my invention, consisting of stretchable material throughout its length, and means at each end of the strap for attachment to two buttonholes on commercially available incontinence garments (a.k.a. belted undergarment). Briefly, the strap is made of an elastic belt 11 about 28cm (11") in length, of which both front and back surfaces are plush, or otherwise conditioned to accept Velcro- or 3M-type hooks anywhere on the surfaces. At each end of the elastic belt is sewed to it a piece of Velcro- or 3M-type hook tape 12, about 4cm (1 ½") in length.

Figure 2 depicts a pair of straps of my invention being used with a commercially available incontinence garment 13. The view depicted here is seen from the left side of the wearer at a slightly downward angle from the back. Velcro- or 3M-type hook tapes 12 on the left side of the wearer are pulled through a pair of buttonholes on the front and back of incontinence garment 13, and are mated with the plush surface of the elastic belt 11 to establish the correct length for the waistline. One of the hook tapes 12 for the other strap on the right side of the wearer is pulled through the right-front buttonhole on garment 13, and is mated with the plush surface of the elastic belt 11. However, for the purpose of illustration, the last hook tape 12 on the elastic belt on the right side is left unmated. As is clear from Fig.2, the pair of straps are placed on the left and right sides of the wearer in this configuration.

Figure 3 depicts the use of my invention for waistlines less than 70cm (28"). At one end of the elastic belt 11, about one third of the belts are pulled through the respective buttonholes on the front (or back) panel of garment 13. Hook tapes 12 at this end of the elastic belts are folded over and mated to the front surface of the belt immediately next to it. Hook tapes at the other end are pulled through respective buttonholes on the back (or front) panels of garment 13, go over the mated hook tape and are then mated with the back side of the belt. In this manner, the total effective length for a pair of straps can be reduced by an additional 15cm (6") without any discomfort resulting from multiple folding

of the belt. As in Fig. 2, the pair of straps are placed on the left and right sides of the wearer in this configuration.

Figure 4 depicts the use of my invention for waistlines less than 56cm (22"). For these purposes, only one strap will be used for each garment. Here, the hook tapes 12 at either end of the strap are pulled through both front and back buttonholes of the garment 13, and are then mated to the front surface of the elastic belt 11. In this configuration, the single strap can be entirely in the front, or entirely in the back, of the wearer.

Figure 5 depicts the use of my design for waistlines less than 25cm (10"). For these purposes, only one strap will be needed for each garment. Here, the hook tape 12 at one end of the strap is pulled through all four buttonholes on the garment 13, and is then mated on the back side of the belt 11 near the other end. In this manner, waistlines as little as 15cm (6") can be comfortably accommodated.

Figure 6 depicts a single strap of my invention made with readily available elastic belt with plush surface on only one side of the belt. Here a segment of Velcro- or 3M-type loop tape 14 is sewed to the plush side of the elastic belt 11 about one third of the way from one end of the belt. Two segments of similar loop tape are each sewed to the non-plush side of the elastic belt (or plush side of the belt if both sides are plush) about one third of the way from either end of the belt. For straps of this design to work in all the configurations depicted here, hook tapes 12 are sewed back to back at each end of the elastic belt 11.

The effective length of the strap of my invention can be increased by connecting two belts in tandem with the hook tapes 12 at the ends of the belt and the loop tapes 14 located at one-third or two-third positions on the belt. As indicated in this figure, simply roll over the upper strap and attach it to the non-plush side of the lower strap with the hook and loop tapes that meet at two locations. In this manner, the effective length of the composite strap can be increased by about 4" (10 cm) and 8" (20 cm) respectively.

REFERENCE NUMERALS IN DRAWINGS

11 Elastic belt

12 Velcro- or 3M-type hook tape

13 Commercially available incontinence garment (a.k.a. belted garment)

14 Velcro- or 3M-type loop tape

15 Plush surface

16 Non-plush surface

DETAILED DESCRIPTION OF THE INVENTION

My invention begins with an elastic belt 11 about 28cm (11") in length, of which both front and back surfaces are plush, or otherwise conditioned to accept Velcro- or 3M-type hooks anywhere on the surfaces (Fig. 1). At each end of the elastic belt is sewed to it a piece of Velcro- or 3M-type hook tape 12, about 4cm (1 ½") in length. For use with a commercially available incontinence garment, the hook tapes 12 at either end are pulled through a pair of buttonholes on the incontinence garment 13. They are next folded over to mate with the front or the back surface of the elastic belt to complete the connection with the garment (Figs.2 and 3). The location of mating is chosen so that the desired length for the elastic belt is established. The desired length for the elastic belt is such that the circumference of incontinence garment and the pair of straps as a whole matches the waistline of the wearer with minimum stretching of the elastic belts. For normal waistlines larger than approximately 56cm (22"), one pair, or two identical pieces, of my design are used for wearing each incontinence garment.

In the manner described above, my invention provides an adjustable range of about 35cm (14 inches) for each pair of straps without any stretching. With appropriate choice of elastics for the belt, stretching of 200% of the original length has been demonstrated routinely. With 18cm (7") spacing between buttonholes on the front and back panels of the incontinence garment, a pair of straps of this design will provide an adjustable range for the waistline from 70cm(28") to 90cm(36") without any stretching, and to up to 200cm(80") with maximum stretching. The adjustable range can be further extended downward to 56cm(22") of waistline by allowing the straps to be doubly-overlapping as depicted in Fig.3. Furthermore, use of a single strap of my invention in a wearing configuration depicted in Fig. 4 will accommodate waistlines from about 56cm (22") down to about 25cm (10"); and to as little as a few inches of waistline by using the configurations depicted in Fig.5.

With my invention, the straps can be worn with minimal stretching to provide optimal comfort and fitness for wearers of any waistline. The stretchable aspect of the design comes to full use only when the garment is to be lowered from, or raised to, the waist of the wearer. By making the straps both stretchable and continuously adjustable, my

invention retains all the functions that the prior-art design enjoys, while at the same time making the extent of stretch optimal for comfort, security, and ease of lowering from and raising to the waist. In this manner, incontinence garment could be fitted to the waist of a wearer with comfort and snugness much like regular underwear, regardless of his/her waistline.

As I have mentioned previously, the commercially available straps designed by Bolick under U.S. Pat. No. 4,315,508 do not function well for a number of reasons. First, they are often too loose to hold a garment in place, particularly when the garment is wet. Secondly, this problem becomes even worse as the straps have been re-used for some time, and there is no mechanism in her design to correct for the loosening of the straps through multiple uses. Thirdly, without the multiple attachment locations in the garment as envisioned by Bolick in the same patent, the garment and the pair of straps as a whole is simply not adjustable without stretching. On the other hand, the experimental use of my designs with my wife in the past year demonstrates most conclusively that my designs function well and are very easy to use. Based on these experimental and empirical considerations, I am satisfied that my invention is far superior to the Bolick design, and affords both the comfort and fit that the Bolick design was aimed, but failed, to accomplish.

Following submission of my PPA 60/425,493 on November 12, 2002, I have been concentrating my effort on finalizing manufacturing plan for the invention. In the process, I found that it is too expensive for the elastic manufacturers to make a custom-run according to my specifications. I have now found an alternative for manufacturing my design using elastic belts that are available off the shelf. My modified design (Fig. 6) is as follows:

(1). The length of each belt is increased from 12.5" to 13.5". However, the belt has plush surface on one side only. (2). At each end of the belt the Velcro- or 3M-type hook tape remains to be 1.25" in length but the hooks are on both sides, that is, two hook tapes are sewed together back to back at each end of the belt. (3). Two segments of ¾" loop tape are each sewed to the non-plush side of the belt one third and two third of the way from

the end of the belt respectively. (4) Another segment of same is sewed to the plush side of the belt, also one third of the way from the end of the belt.

Aside from the fact that they allow use of readily available elastic belts, these changes also perform the following functions exceedingly well. (1) The two segments of loop tape on the non-plush side of the belt allow my invention to work as direct replacement of buttoned belts currently available in the market. (2) They also make it easier to fold the belt twice for waistlines slightly larger than 24". (3) The segment on the plush side helps securely anchor the two belts together when they are to be connected in tandem. The combined strap can then be used in a manner depicted in Fig.5 to accommodate waistlines in this range. It follows that my invention can truly provide a one-sized product that fits all. The economic advantage inherent in this design for mass-production and distribution is unquestionably substantial.

The table below summarizes the capabilities of my adjustable strap, whose utility now appears to be universal.

Table: Waistline Coverage

Waistline (inches)	No. Belts Required	Max. Hip Clearance(inches) (100% Elongation)
20" and Below	1	33"
20" -- 24"	2	51"
24" -- 40"	2	66"
40" -- 58"	4	102"

NOVEL FEATURES AND ADVANTAGES OF THE INVENTION

The novel feature of my invention is the incorporation of an adjustable element into the belt or strap, making it both stretchable and continuously adjustable in length. When used in lieu of prior-art straps, this novelty immediately brings forth the following advantages:

(1) With minimal stretching, the incontinence garment could be fitted to the waist of a wearer with comfort and snugness much like regular underwear.

(2) With a pair of straps of my invention, the incontinence garment could, much like regular underwear, be lowered from the waistline of the wearer, and raised to the waistline again, without detaching any strap(s) from the garment, or removing the garment from the wearer altogether.

(3) Unlike regular underwear, soiled garment worn with the straps of my invention can be removed from the wearer simply by detaching one end of the straps from the garment.

(4) With commercially available incontinence garment, straps of my invention can provide an adjustable range for the waistline from that of an infant to as large as 58" without any stretching and up to 100" with 100% elongation of the elastic belts.

(5) My design truly provides a one-sized product that fits all. This feature can mean significant economic advantage in reducing the cost of production and distribution.

(6) The straps of my invention may also be very useful for disposable diapers, and for casual and sports clothing. For example, it can be used to make the sleeve opening on a snow jacket adjusted snugly tight around the wrist, while at the same time to allow it to be stretched wide for a quick look for time on the wrist watch.

(7) Straps of my design can be used as direct replacement of buttoned belts currently marketed by most of the manufacturers of belted undergarments.